

2002 Annual Compliance Report Tuba City, Arizona, Disposal Site

Compliance Summary

The site, inspected on September 10, 2002, was in excellent condition. Plant abundance on the cover and side slopes had significantly decreased since the previous inspection. Sand accumulation on the rock apron along the south toe of the disposal cell and in the drainage ditches was unchanged from last year and does not prevent these features from functioning as designed. The Long-Term Performance Project continues to evaluate long-term effects of sand accumulation and the plant encroachment, particularly growth of deep-rooted plants, on the disposal cell and rock apron. Revegetation of areas adjacent to the disposal cell disturbed by ground water remediation activities has been slow but appeared to be progressing. Results of ground water monitoring showed little variation from results reported in 2001. No maintenance was required, and no need was identified for a follow-up or contingency inspection.

Compliance Requirements

Requirements for the long-term surveillance and maintenance of the Tuba City, Arizona, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I disposal site are specified in the *Long-Term Surveillance Plan for the Tuba City, Arizona, Disposal Site* (DOE/AL/62350-182, Rev. 0, U.S. Department of Energy [DOE], Albuquerque Operations Office, October 1996) and in procedures established by the DOE Grand Junction Office to comply with requirements of Title 10 *Code of Federal Regulations* Part 40.27 (10 CFR 40.27). These requirements are listed in Table 19-1.

Table 19-1. License Requirements for the Tuba City, Arizona, Disposal Site

Requirement	Long-Term Surveillance Plan	This Report
Annual Inspection and Report	Section 6.1	Section 1.0
Follow-up or Contingency Inspections	Section 7.0	Section 2.0
Routine Maintenance and Repairs	Section 8.0	Section 3.0
Ground Water Monitoring	Section 5.2	Section 4.0
Corrective Action	Section 9.0	Section 5.0

Compliance Review

1.0 Annual Inspection and Report

The site, east of Tuba City, Arizona, was inspected on September 10, 2002. Results of the inspection are described below. Features mentioned in this report are shown on Figure 19-1. Numbers in the left margin of this report refer to items summarized in the Executive Summary table.

Many features at the site, such as office buildings, evaporation ponds, water treatment plant, and a network of extraction and injection wells, are not described in the Long-Term Surveillance Plan. These features are associated with active ground water remediation activities conducted by the Uranium Mill Tailings Remedial Action (UMTRA) Ground Water Project. The annual inspection does not include these features or structures.

1.1 Specific Site Surveillance Features

Access Road, Fence, Gate, and Signs—A short, hard-packed and graveled track leads from U.S. Highway 160 to the entrance gate in the fence along the northern edge of the disposal site. The gate was in excellent condition and secured by a lock.

The security fence around the site is chain link with three strands of barbed wire at the top. With one exception, the security fence was intact and in good condition at the time of the annual inspection. The bracket supporting the three strands of barbed wire at the west end of the entrance gate was broken and will be replaced.

One entrance sign and 30 perimeter signs are located around the site. All signs are on steel posts inside the fence and set back about 5 feet from the site boundary. Attached below each perimeter sign is a pictorial sign showing the disposal cell configuration. Some signs have bullet holes or dents, but all were fully legible.

The Navajo Abandoned Mine Lands office phone number at the site entrance sign was updated with the current phone number: (800) 871-6982.

Markers and Monuments—Two granite site markers, one near the entrance gate and the other on top of the disposal cell, were in excellent condition. One boundary monument and three combined survey/boundary monuments mark the four corners of the site. Each monument is set back at various distances from the true corners of the site boundary. Approximately 3 inches of sand had to be removed to locate boundary monument BM-3; however, all monuments were undisturbed and in excellent condition.

Monitor Wells—The seven wells of the site ground water monitoring network were found to be secure and in excellent condition.

1.2 Transects

To ensure a thorough and efficient inspection, the site was divided into three areas referred to as transects: (1) the disposal cell; (2) the area between the disposal cell and the site boundary; and (3) the outlying area.

Disposal Cell—The disposal cell is covered with riprap for erosion protection. The rock was in excellent condition. Inspectors discovered no evidence of slumping, settling, or instability on the top or side slopes of the disposal cell.

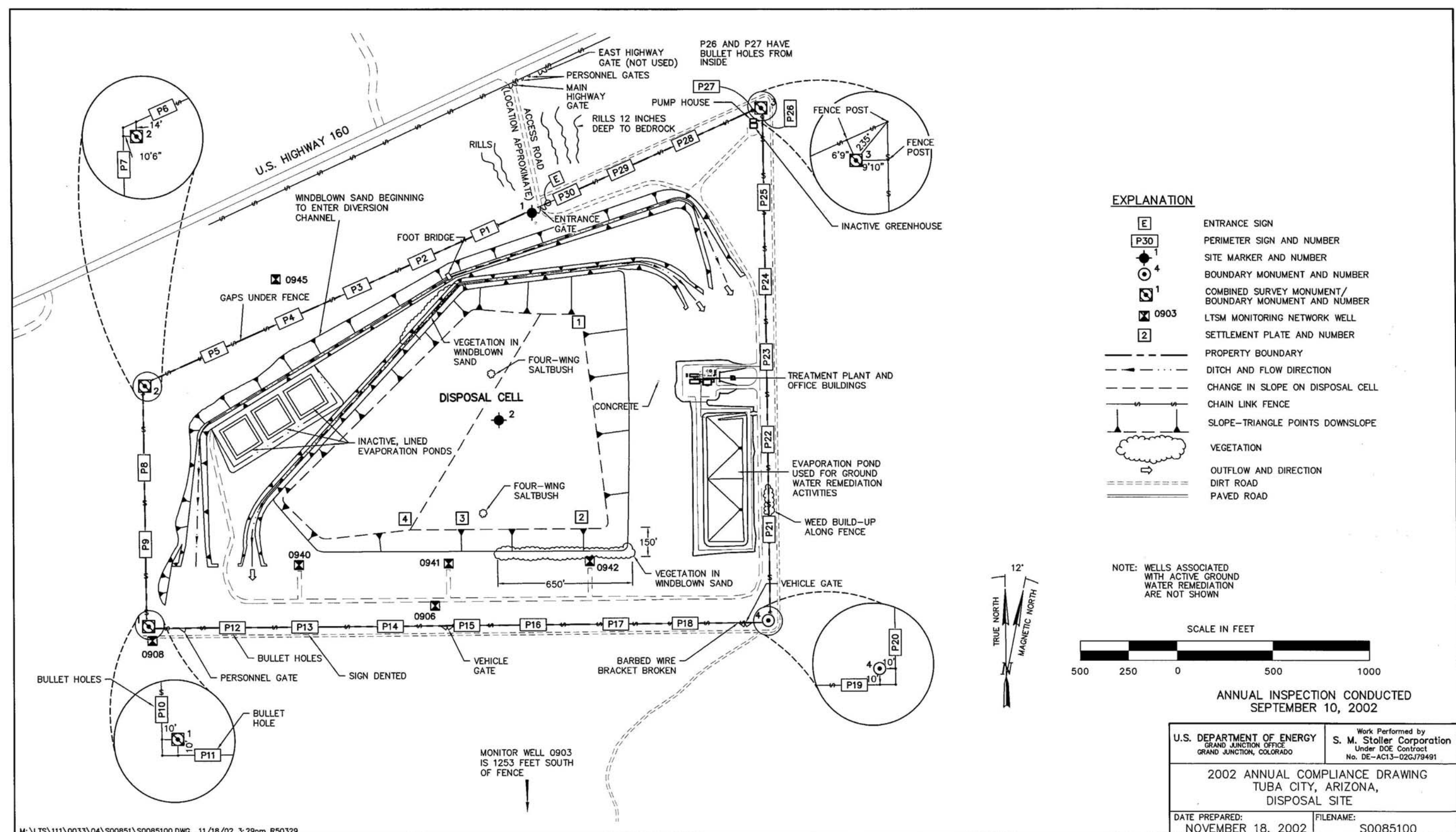


Figure 19-1. 2002 Annual Compliance Drawing for the Tuba City, Arizona, Disposal Site

Patches of dead kochia and Russian thistle were seen on the south side slope and top slope of the cell. A few patches of these weeds were present on the west and north side slopes. The reduced quantity of annual weeds when compared with previous years was likely due to drought conditions during the 2002 growing season. Inspectors continue to monitor changes in plant cover with photographs, which are taken from selected vantage points on an annual basis.

- 19B During the past summer, woody plants on the cell, primarily four-wing saltbush, were cut and their stumps treated with herbicide. The removal effort was effective because only two small plants were noted growing on the cell.

- 19C Although annual accumulation is small, sand continues to accumulate on the south rock apron, where it fills interstices in the riprap. This has encouraged establishment of shrubs and perennial grasses in the rock apron. Neither the sand nor the plants appear to compromise the erosion protection. However, the Long-Term Performance Project continues to evaluate the long-term effect of these plants, particularly the deep-rooted plants, on the disposal cell and the rock apron.

Area Between the Disposal Cell and the Site Boundary—Ongoing ground water remediation activities continue to disturb small portions of the area between the disposal cell and the site boundary. Revegetation of these areas is slow but progressing. Inspectors will continue to monitor revegetation to ensure the existing vegetative cover is not further degraded by on-site activities and that it progresses toward a condition typical of the surrounding native plant community.

- 19D Another ongoing issue at the site is tumbleweed (dead Russian thistle) and sand accumulation along the fence lines. Tumbleweeds tend to accumulate along the west and northeast portions of the perimeter fence, and sand tends to accumulate along the western fence line. At the time of the 2002 inspection, neither tumbleweed nor sand accumulation was considered significant enough to require maintenance.

Two rock-lined drainage channels are constructed on the north (upslope) side of the disposal cell. The outermost channel intercepts storm water and diverts it around the disposal cell to the south and east. The inner drainage channel, constructed at the toe of the north and northwest sides of the disposal cell, collects runoff from the disposal cell itself and diverts it to the south and east as well. Sand accumulation in the inner diversion channel and in the northwest segment of the outer diversion channel was unchanged since the 2001 inspection and does not interfere with the channels' drainage function.

Outlying Area—The area beyond the site boundary for a distance of 0.25 mile was visually inspected. No erosion or new development, with the exception of ground water remediation activities, was noted. Some areas south of the disposal cell have recently been disturbed by UMTRA Ground Water Project activities. These areas may be subject to erosion and will be monitored.

2.0 Follow-Up or Contingency Inspections

No follow-up or contingency inspections were required in 2002.

3.0 Routine Maintenance and Repairs

Woody plants on the cell were cut and their stumps were treated with herbicide.

4.0 Ground Water Monitoring

19E DOE monitors ground water to compare current conditions with baseline water quality. This monitoring will not be indicative of disposal cell performance because baseline (background) water quality is degraded by contamination from former milling activities that will likely mask contamination that might leach from the disposal cell.

Pursuant to the Long-Term Surveillance Plan, DOE monitors seven wells (Table 19–2) for four target analytes—molybdenum, nitrate, selenium, and uranium. In 40 CFR 192 Table 1 of Subpart A, the U.S. Environmental Protection Agency has established maximum concentration limits for these analytes in ground water. These limits are 0.1 milligrams per liter (mg/L) for molybdenum, 44 mg/L for nitrate (as NO₃), 0.01 mg/L for selenium, and 0.044 mg/L for uranium. Time-concentration plots for the four analytes are shown on Figures 19–2 through 19–5.

Table 19–2. Ground Water Monitoring Network at the Tuba City, Arizona, Disposal Site

Monitor Well	Hydrologic Relationship
0903	Downgradient, off site
0906	Downgradient, baseline
0908	Downgradient, baseline
0940	Downgradient, disposal cell boundary
0941	Downgradient, disposal cell boundary
0942	Downgradient, disposal cell boundary
0945	Upgradient, baseline (background)

Sample results from 2002 indicate that ground water quality downgradient of the former millsite is degraded with respect to three of the four target analytes (nitrate, selenium, and uranium). Overall ground water quality did not change significantly between 2001 and 2002.

Molybdenum concentrations did not exceed the 0.1 milligram per liter (mg/L) standard in samples from any well in 2002. Except at well 0906, molybdenum concentrations have not varied significantly in the last 15 years (Figure 19–2). Samples from well 0906 typically have had higher and more variable molybdenum concentrations than samples from other wells.

In 2002, the concentration of nitrate (as NO₃) exceeded the 44 mg/L standard in samples from all monitor wells except well 0945, the background well. Between 2001 and 2002, no significant increases or decreases in concentrations were observed in samples from any well, although concentrations varied considerably—by more than two orders of magnitude—from well to well (Figure 19–3).

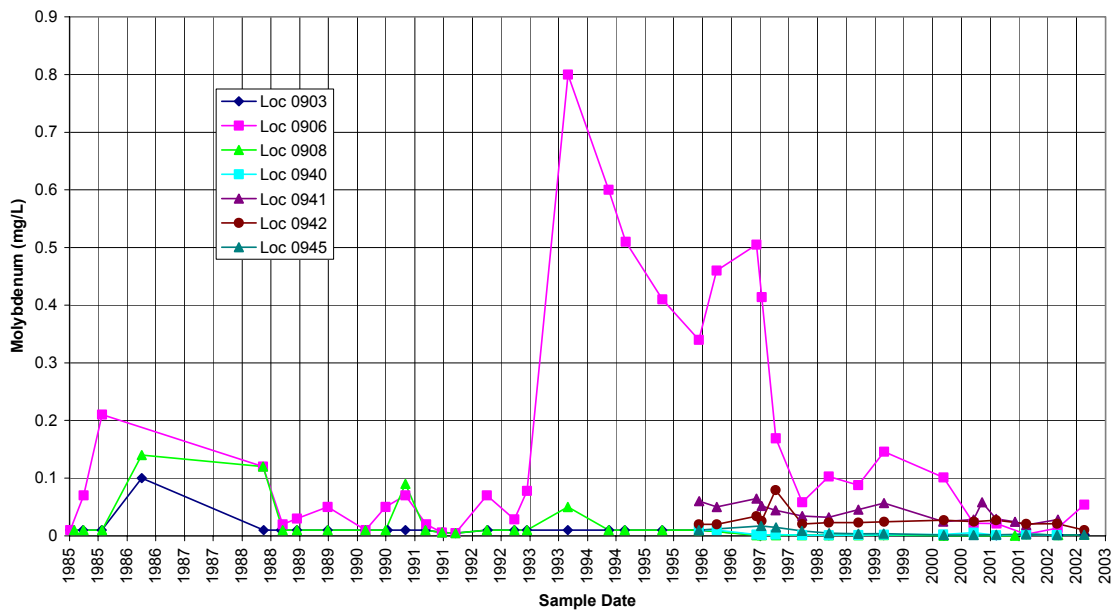


Figure 19–2. Time-Concentration Plots of Molybdenum in Ground Water at the Tuba City, Arizona, Disposal Site

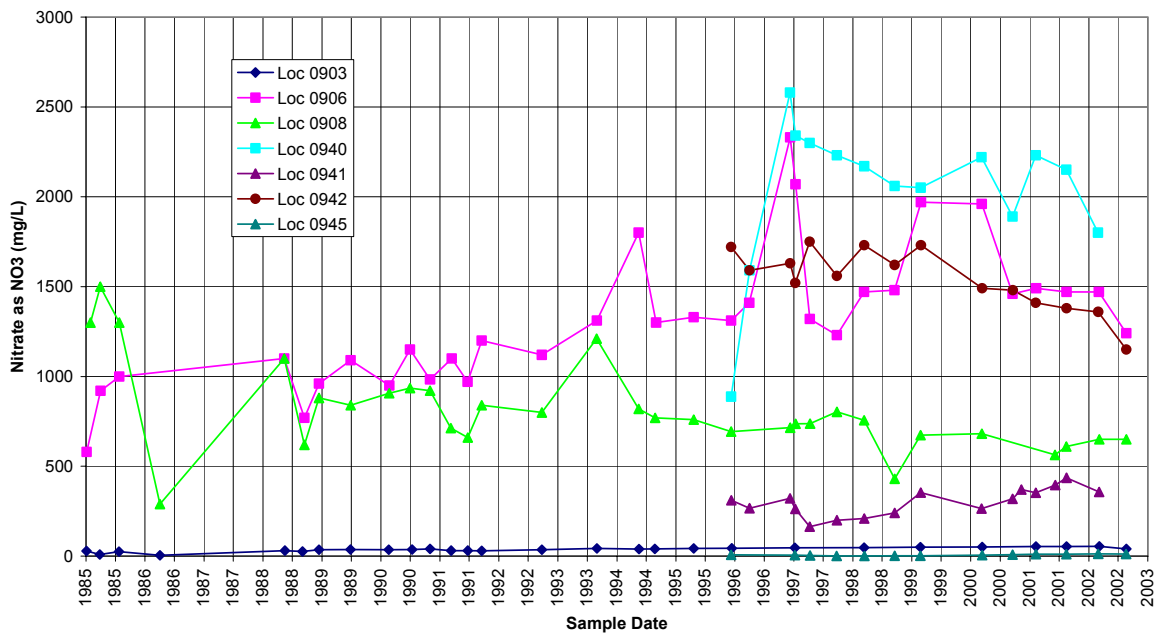


Figure 19–3. Time-Concentration Plots of Nitrate (as NO₃) in Ground Water at the Tuba City, Arizona, Disposal Site

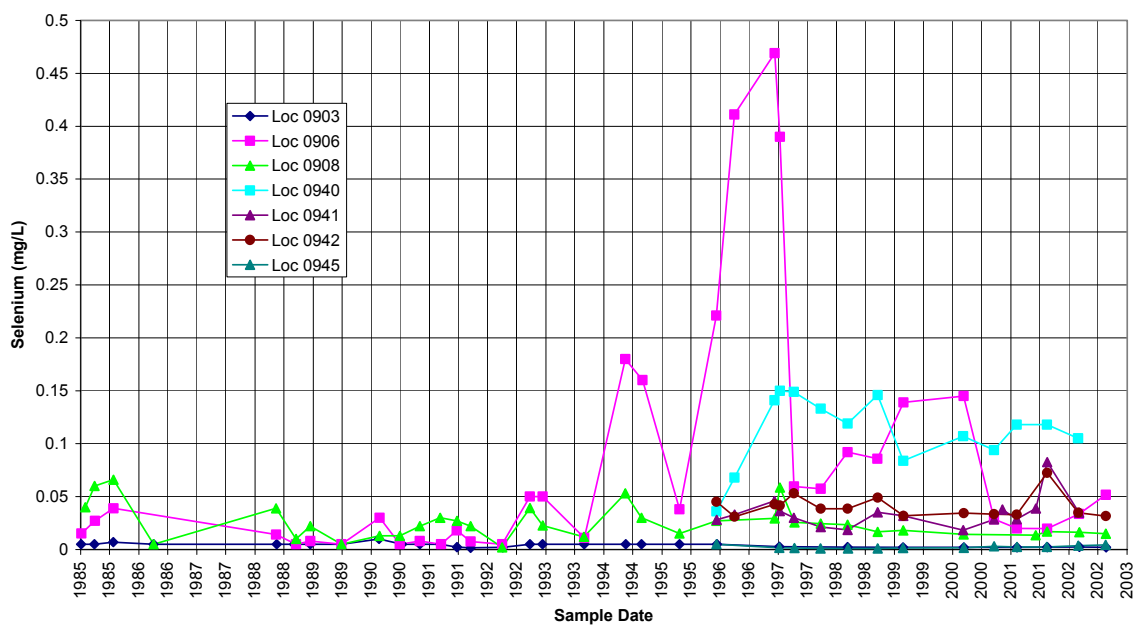


Figure 19-4. Time-Concentration Plots of Selenium in Ground Water at the Tuba City, Arizona, Disposal Site

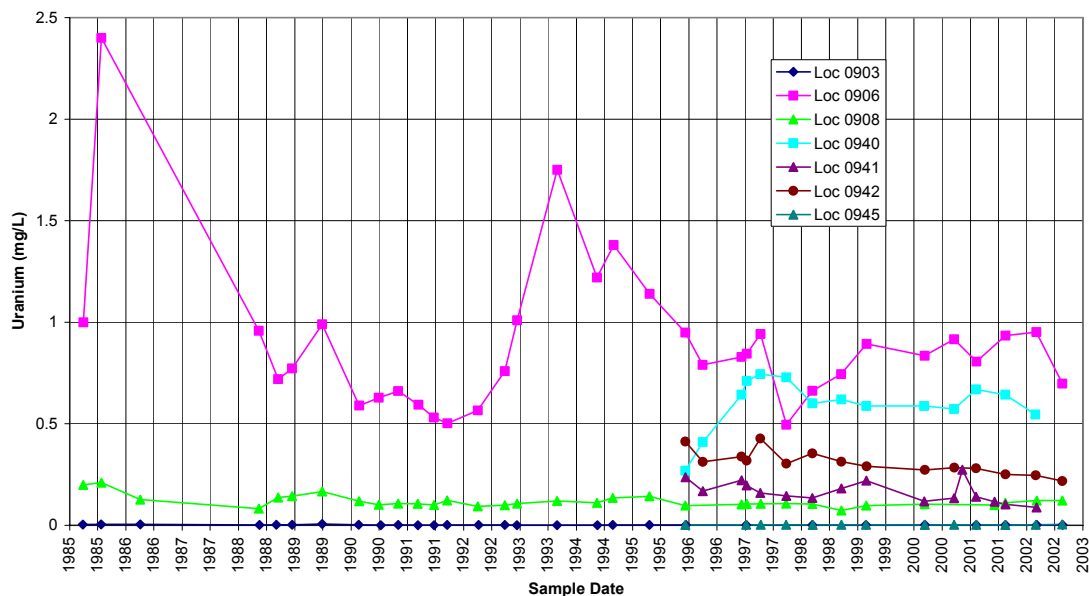


Figure 19-5. Time-Concentration Plots of Uranium in Ground Water at the Tuba City, Arizona, Disposal Site

Consistent with historical data, selenium concentrations exceeded the 0.01 mg/L standard in 2002 in samples from all wells except background well 0945 and off-site, downgradient well 0903. Selenium values have remained fairly consistent in samples from all wells except 0906 and 0940 (Figure 19–4).

Uranium concentrations exceeded the 0.044 mg/L standard in 2002 samples from all wells except background well 0945 and off-site, downgradient well 0903. Concentrations have remained fairly constant over time in samples from all wells except 0906 and 0940 (Figure 19–5).

5.0 Corrective Action

Corrective action is action taken to correct out-of-compliance or hazardous conditions that create a potential health and safety problem or that may affect the integrity of the disposal cell or compliance with 40 CFR 192.

No corrective action was required in 2002.

End of current section